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ABSTRACT

This paper describes the instructional design activities used to create ThinkAbout, a video series meant to teach fifth and sixth graders skills essential for learning, i.e., inquiring, analyzing, synthesizing, seeking alternatives, and creative problem solving. Two basic tenets or underpinning statements served as guidelines for the development of the series: skills, whatever they are, require constant use to keep them operative; and the more practically and realistically and the more often a skill is properly applied in a variety of contexts by the student, the more likely it will actually belong to, and be used by, him/her. Components of reasoning and thinking which formed the core of the series were organized in such clusters as "Finding Alternatives," "Estimating and Approximating," "Giving and Getting Meaning," and "Collecting Information." The clusters were further developed to permit various strategies for achieving the purpose of the cluster. After a year of use, the cumulative effect of working with the series seems to be that students are looking more carefully at the route to solutions for problems. (Author/LLS)

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USING TV TO TEACH HIGH ORDER THINKING SKILLS

by

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USING TV TO TEACH HIGH ORDER THINKING SKILLS

A paper delivered at the "National Conference on Technology and Education---Policy, Implementation, Evaluation" at the Shoreham Hotel, Washington, D.C. on January 28, 1981.

The professional literature of the last two years abounds with references to cognition, problem solving, concept development, associative thinking, critical thinking, reasoning, productive thinking, and creative thinking.

Those who know the theories of learning and cognition fields will recognize, however, that this attention to the higher order skills is a renewal of interest. James, Thorndike, Thurstone, Gagne, Piaget, Russell, Getzels, Covington, Bruner, Salomon and many others have devoted their professional lives to research and the development of hypotheses about the components of thinking and what skills are necessary to solve problems creatively.

What are the "higher order skills"? There is probably not much disagreement that they include inquiry, analysis, synthesis, and evaluation. Theories of learning, in the majority, hold that knowledge that is organized and related is better learned and retained than knowledge that is specific and isolated. Curricula organized around scope and sequence are designed to provide the "organization" and the order that seem to be necessary for most people to use these learning tools critically and creatively. There are always hidden agenda in instructional materials -- a master plan of what ought to be introduced first, reviewed, and reapplied. Sometimes the sequence and the application are too subtle to be identified by the learner; he doesn't recognize that he is the learner and that he does have command of the information. Sometimes the provisions for application are artificial and seem unreal, and the learner is reasonably sure that he will never have

an opportunity to use this information and that no one else will use it either. What the student needs is evidence that he can do something with the knowledge he has acquired, that he can apply the information to new situations and problems. He expects to be able to select an appropriate technique for attacking a new problem and to use his information (facts and concepts) to solve it. The capacity to do this is frequently called reasoning or critical thinking, but regardless of its name, it provides the learner with a solid feeling of being in control, of having a handle on his world, of being able to solve a problem.

And why would we want to try to <u>teach</u> these components of thinking via television?

First, it is necessary to look at television as a medium for instruction rather than entertainment - in other words, to indicate why television is for learning.

Television is a powerful motivator - it provides the viewer with direct contact, it can span history, it can pick out a wee piece of history or a theory or a --- and turn it around in the camera's eye much as a gemologist would turn a diamond as he searched for quality or for flaws, it brings directly to the viewer the hustle and bustle of a city, the sights and sounds or the tranquility of hundreds of acres of farmland in a country or the sight of tears, pain, poverty or joy, warmth, friendship. It can pace the learner, it can challenge, it can comfort, it can capitalize on the receptivity of most young people to the "visual" and to the "aural", it can put the viewer/learner in the center of a problem and give him some analytical tools and suggestions to solve the problem. It can make review (often boring in other media but always necessary) interesting and stimulating because it can help to apply newly acquired skills in wholly different content and context yet help the "skill" to stick right out at the learner.

An instructional television program represents hundreds of hours of planning, of research, of organization and conversion of ideas to practical segments of instruction.

It maintains a steady enthusiasm and efficiency unlike the human who may present a super lesson, wisely planned and executed once a day but whose energies are drained and whose capacity to sustain that quality level of "super" is eroded by interruption and other responsibilities.

Television gives the best bargain for one's investment - it is cost effective - but though cost effectiveness and efficiency are not only buzz words but popular concepts, it is the quality of instruction which television can bring which is so vital. There simply is no substitute for quality instruction.

In 1974-75 I had the rich professional experience of preparing a prospectus for an instructional television series concerned with skills essential for learning. In the course of thinking about the task and finally writing about it, I spent hours researching and discussing with colleagues the cricial components of essential skills for learning - inquiring, analyzing, synthesizing, seeking alternatives, and creative problem solving, indeed - reasoning and thinking.

There were many professional colleagues who questioned my sanity, since those components are alleged to be handled best by a teacher face to face with a student.

I was proposing that television could help in the task because it could provide a variety of strategies for introducing or reviewing, enhancing and extending, the higher order skills of reasoning and thinking, problem solving, synthesis, evaluation, "creative thinking."

Television, I argued, could help kids to "see" these components being used - they could, in fact, be a part of the solution of real problems because the thinking process related to the solution could be visualized and an assortment of more complex problems requiring increased reasoning talent could readily be provided.

From that paper and subsequent years of inquiry into "thinking" an instructional design emerged. I had the tremendous good fortune to work

with two of the most intellectually capable people I know - Dr. Jerry Brown and Dr. Priscilla Denby who served as the major instructional designers for the series, "ThinkAbout", prepared for the consortium of 41 State Departments of Education and instructional television agencies in the United States and Canada under the direction of the Agency for Instructional Television.

The design of "ThinkAbout" had some tenets or "underpinning" statements by which we all "lived" as we worked on the development of the series.

Two basic guidelines were: (1) skills, whatever they are, require constant use to keep them operative, and (2) the more practically and realistically and the more often a skill is properly applied in a variety of contexts by the student, the more likely it will actually belong to him and be his to use for a lifetime.

We assumed this posture about "acquiring" skills. The term "acquire" means to "gain by any means, usually by one's own exertions....or, to get as one's own." As indicated earlier, one of the reasons why students fail to identify basic skills instruction as useful and necessary for them (and therefore to profit from it) is that the instruction frequently conveys the idea that the skills have no real, everyday value. Students think that it is merely the teacher who has decided that these skills are necessary, so I continued to press the point - "If the emphasis is on "acquiring" skills, the total design of the series will have to assume a posture of involving the student so that through his own participation he will acquire, as his own, the skills essential to learning."

And some "concomitant concerns" we hoped to address via the series - a sort of hidden agenda - were - the concomitant learnings which are available to children when instruction is carefully planned and when full advantage is taken of the opportunities to point out relationships are many.

Accordingly, as the instructional design team for the project prepared material, we were especially aware of additional purposes to

- help students to recognize that "learning" is an appealing adventure

- attract and sustain the student's interest in learning
- assist the student to identify the learning style which seems to fit him best
- assist the student to realize how one learns and why some parts of the learning process have been assigned to the school
- help the student to appreciate why the skill is essential
- assist the student to become capable of self-diagnosis of his level of performance in the essential skills.

Throughout the series, whenever possible, through the content selected to present the skills essential to learning, the design team made every effort to include reference to the following:

- learning to make good choices and good decisions and acting in ways commensurate with those decisions are persistent goals
- observation is an important learning tool
- expressing one's thoughts and feelings well is productive
- reading can produce personal enjoyment
- style and taste can be developed
- aesthetics and values are an integral part of learning
- clarity and precision in speaking and writing are a courtesy to one's reader or listener
- memorizing some items one needs regularly is a legitimate activity
- non-verbal communication skills are essential
- visual literacy, the ability to recognize and draw information from sources other than print, is an essential skill
- problem solving skills apply to almost eveything one is called upon to do.

As Dr. Brown and Dr. Denby worked on the design, the interdisciplinary character of the series was very evident because we were using the same processes for attacking and solving a problem in a math context as in a discussion about energy conservation.

Later, as scripts were written, the very skillful pattern of "layering" in all the disciplines and the components of problem solving evolved by Dr. Brown, became the interdisciplinary backbone of the series.

After months of study, it was necessary to "anchor" some components of reasoning and thinking which we hoped would be the core of the series. They were organized in Clusters:

"Finding Alternatives"

"Estimating and Approximating"

"Giving and Getting Meaning"

"Collecting Information"

"Classifying"

"Finding Patterns"

"Generalizing"

"Sequencing & Scheduling"

"Using Criteria"

"Reshaping Information"

"Judging Information"

"Communicating Effectively"

"Solving Problems"

The clusters were further developed to permit various strategies for achieving the purpose of the cluster.

A sample of a cluster and its "parts" is:

Solving Problems

- Solving one problem may create another
- The amount of time given to thinking about a problem before acting should vary with the importance of the problem and the amount of time available
- Solving a problem often involves a risk
- Solving problems requires persistence

Let's take a quick look at the "intro" information in the Teacher's Guide to this cluster.

"CLUSTER GOAL

To help students:

- Decide how much time to give to thinking about (or trying to solve) a problem.

- Realize that risk-taking is part of problem-solving, and that one must decide upon how much risk one wants to accept when preparing a plan to solve a problem.

- Accept failures in problem-solving, learn from them, and persist.

"ABOUT SOLVING PROBLEMS

'ThinkAbout' programs have presented many different problems, and all of them have been approached in a thoughtful way by on-screen characters. Repeatedly, real-life ten-to-twelve-year-olds have had opportunities to observe and discuss how their on-screen counterparts try to solve problems and how, in most cases, they succeed.

By now students may agree that:

- A planned approach to solving problems is usually preferable to an unplanned approach.

- It is important to have alternatives.

- There seldom is "one best" way to solve a problem.

This cluster introduces four additional ideas about solving problems. In solving a problem one must be aware that other problems may be created. The amount of time devoted to thinking about a problem (or trying to solve it) must "fit" the problem and the situation. Risk-taking is an inherent part of problem-solving and must be considered when weighing alternatives. Failures can be expected in problem-solving; persistence and willingness to learn from past mistakes are crucial.

These are important ideas. It is easy to assume that a carefully thought out plan cannot fail, to become discouraged if it does, to reject the value of a thoughtful approach, and to ask, Why bother? A planned approach to problem-solving is not a guarantee for success on the first try, or ever. Rather, a planned approach offers people the best chance of eventually finding a solution. It is a way; it is not an end. By integrating the ideas in these four programs with the ideas of other programs, students will have powerful guides to use in tackling problems, in school or out. They will be 'ThinkAbouters.'"[1]

Each program of the sixty has its own story line which intrigues the students and virtually wraps around them so that they become as involved in solving problems or finding patterns.

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1. Teacher's Guide to THINKABOUT, a video series for fifth and sixth grades in the Skills Essential to Learning, pp 78 & 79, Bloomington, IN. Agency for Instructional Television, 1979.

After a year of use, the cumulative effect of working with the series seems to be that students are looking more carefully at the route to solutions for problems. After the second year, we'll know more, of course. Our goal has been to help the students get handles on their own world - solving problems requires persistence!

Reasoning, thinking, and all those other components seem, indeed, to be being taught via television.

Solving problems requires a risk, too, and we took it!

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